Title: Coherent Nanodispersion-Strengthened Shape-Memory Alloys

Inventors: Jin-Won Jung, et al. Filing Date: March 25, 2004 04019.00048 – Sheet 1 of 9

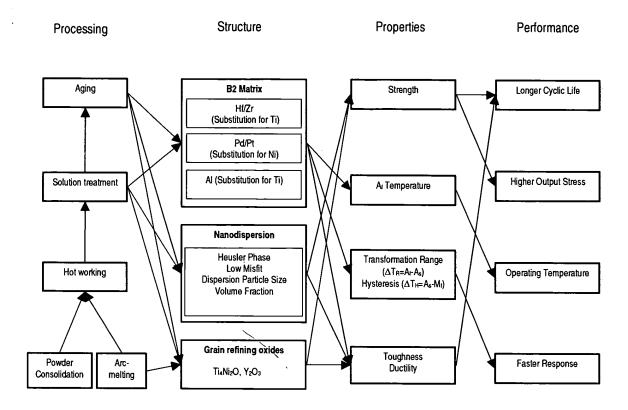


Figure 1: Systems design chart of coherent nanodispersion-strengthened SMAs.

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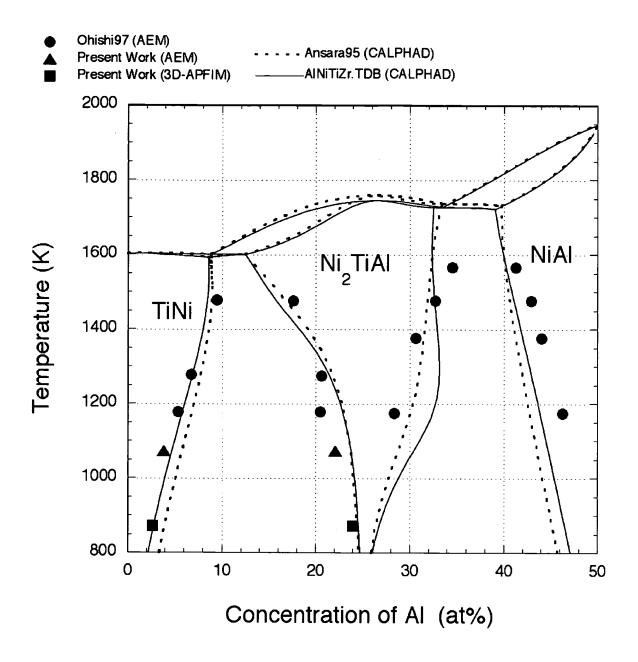


Figure 2: Calculated pseudo-binary phase diagram of TiNi-NiAl.

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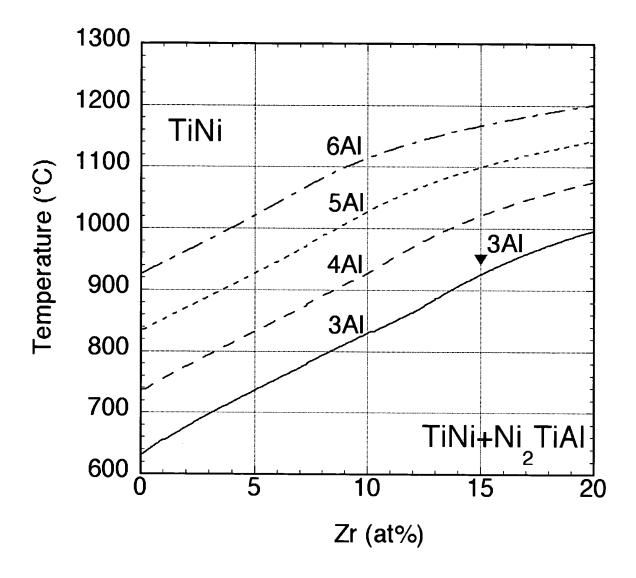


Figure 3: Solution Temperature vs. Zr Content.

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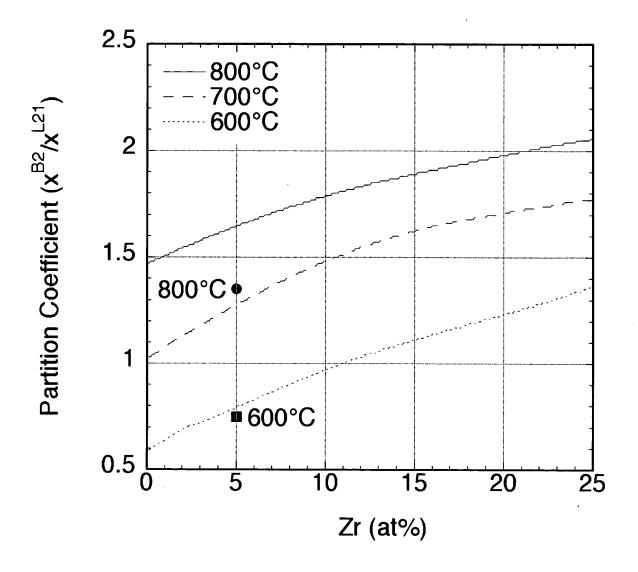


Figure 4: Partitioning of Zr between B2-TiNi and L2₁-Heusler phases.

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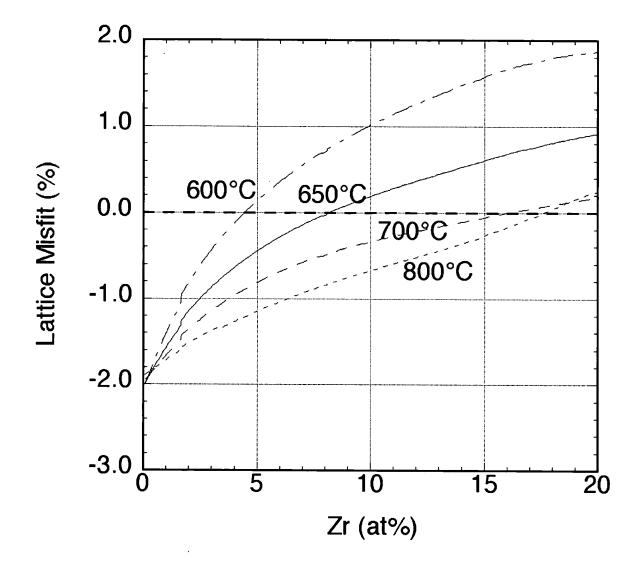


Figure 5: Ambient interphase lattice misfit vs. Zr content.

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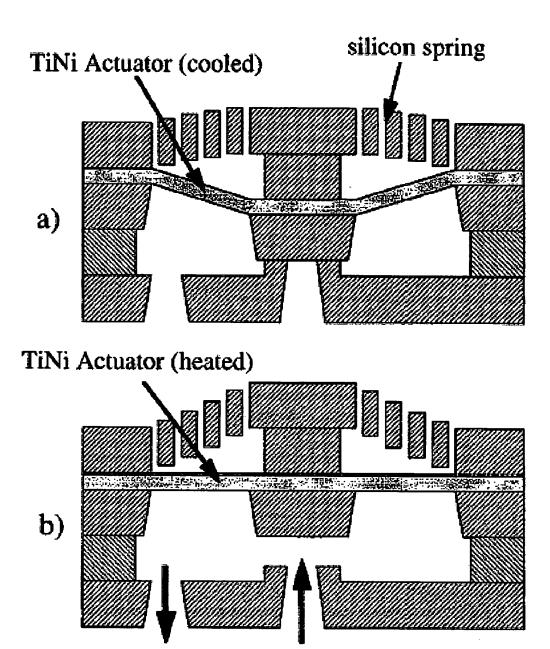


Figure 6: Microvalve using TiNi microactuators in (a) cooled and (b) heated state.

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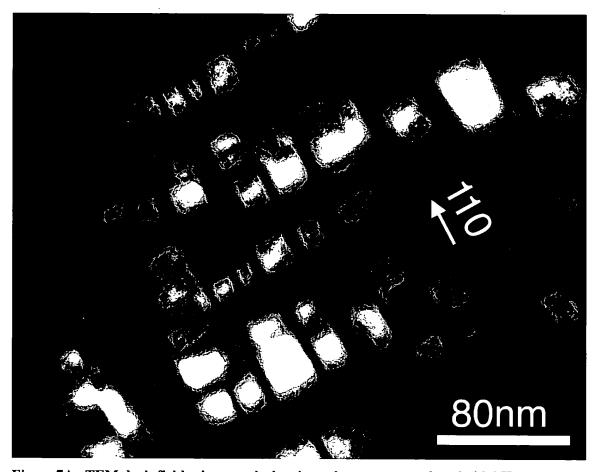


Figure 7A. TEM dark-field micrograph showing coherent nanoscale cuboidal Heusler precipitates in Ni-45Ti-5Al (in at%) aged at 600°C for 2000 h.

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Jon O. Nelson – 312-463-5000

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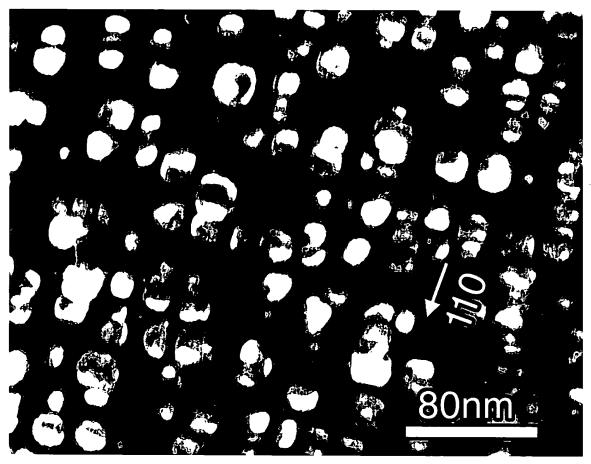


Figure 7B. TEM dark-field micrograph showing coherent nanoscale spheroidal Heusler precipitates in Ni-40Ti-5Al-5Zr (in at%) specimen aged at 600°C for 2000 h.

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Inventors: Jin-Won Jung, et al.

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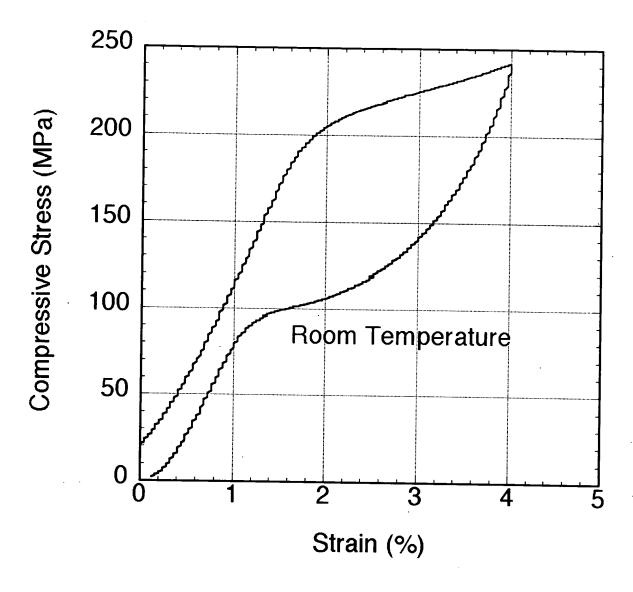


Figure 8. The compressive stress-strain response of Ni-47Ti-3Al-25Pd aged at 600°C for 100 h, tested at room temperature. Strain includes machine compliance.